CLAIMS

1. A phosphor substrate prepared by crystallization from supercritical ammonia-containing solution,

wherein said phosphor substrate comprises nitride containing at least one element selected from Group XIII (IUPAC 1989) having a general formula XN, wherein X is at least one element selected from B, Al, Ga and In, a general formula HN:Y, wherein X is at least one element selected from B, Al, Ga and In, and Y is at least one element selected from Be, Mg, Ca, Sr, Ba, Zn, Cd and Hg, or a general formula HN:Y,Z, wherein X is at least one element selected from B, Al, Ga and In, Y is at least one element selected from Be, Mg, Ca, Sr, Ba, Zn, Cd and Hg, and Z is at least one element selected from C, Si, Ge, Sn, Pb, O and S.

2. A light emitting device comprising an n-type nitride semiconductor layer, an active layer comprising a nitride semiconductor, and a p-type nitride semiconductor layer, formed on a substrate for growth,

wherein said substrate is a phosphor substrate comprising nitride which is prepared by crystallization from supercritical ammonia-containing solution and contains at least one element selected from Group XIII (IUPAC 1989) having a general formula XN, wherein X is at least one element selected from B, Al, Ga and In, a general formula

XN:Y, wherein X is at least one element selected from B, Al, Ga and In, and Y is at least one element selected from Be, Mg, Ca, Sr, Ba, Zn, Cd and Hg, or a general formula XN:Y,Z, wherein X is at least one element selected from B, Al, Ga and In, Y is at least one element selected from Be, Mg, Ca, Sr, Ba, Zn, Cd and Hg, and Z is at least one element selected from C, Si, Ge, Sn, Pb, O and S.

3. The light emitting device according to claim 2, wherein said light emitting device has at least one phosphor layer on said phosphor substrate.

4. The light emitting device according to claim 2 or 3, wherein said light emitting device forms a flip chip type light emitting device equipped with a pair of positive and negative electrodes formed on the same plane.

5. A process for obtaining a phosphor bulk single crystal in an autoclave 1 for preparing supercritical solvent, a convection control means 2 for establishing a convection flow and a furnace unit 4 equipped with a heating device 5 and a cooling device 6,

wherein the temperature inside the autoclave is controlled to obtain a predetermined temperature gradient by said heating device 5 and/or said cooling device 6,

wherein the convection control means 2 comprises at least one horizontal baffle 12 having a central opening and/or a space between the baffle and an inner wall of the

autoclave, and separating the dissolution zone 13, where the feedstock 16 is located above said baffle from said crystallization zone, where the seed 17 is located below said baffle,

wherein a convection flow rate of the supercritical solution between said dissolution zone 13 and said crystallization zone 14 is determined by a degree of opening of said convection control means 2 and a temperature difference between said dissolution zone 13 and crystallization zone 14,

wherein nitride is dissolved in the supercritical solvent containing ammonia and at least alkali metal ions to make the supercritical solution, in which the nitride has a negative temperature coefficient of solubility and the supercritical solution is supplied from said dissolution zone 13 to said crystallization zone 14 in which the seed is located through said convection control means 2, so that nitride crystal is selectively grown on the seed arranged in the autoclave by maintaining supersaturation of the supercritical solution with respect to the seed at the predetermined raised temperature and controlling below a certain concentration, so as not to allow spontaneous crystallization.

6. The process according to claim 5, wherein the ratio of diameter to total length of the autoclave is set from 1/15

to 1/3, the ratio of opening in said horizontal baffle on the cross-sectional area is set at 30% or less and growth rate on the seed is 10 μm/hr or more.

7. The process according to claim 5, wherein at least one element of Li, Na or K and at least one element of Mg or Ca are used as a mineralizer.